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NOTES ON THE BIOLOGY OF *LEMIDEA SUBAENEA* (COLEOPTERA: CLERIDAE) ON *ACACIA* IN VICTORIA

By T. R. New

Dept. Zoology, La Trobe University, Bundoora, Victoria, Australia, 3083.

Abstract

Lemidea subaenea Mulsant is univoltine: predatory adults occur from August to November, and larvae until March-April. *L. subaenea* was the most abundant clerid collected on *Acacia* spp from 1974-77. Feeding biology and life cycle are briefly outlined, and attention is drawn to a possible regular feeding association with psyllids.

Introduction

Arboreal Cleridae have been little studied in association with *Acacia*, and the only comprehensive ecological data on such relationships is limited to African species (Mateu, 1975). The twelve species studied by Mateu were predominantly associated with xylophagous prey, and this feeding habit occurs commonly in the Cleridae (Böving and Champlain, 1920; Balduf, 1935). Few other feeding associations have been reported. During surveys of insects on various species of *Acacia* in Victoria, larvae and adults of *Lemidea subaenea* Mulsant were collected each year from 1974-1977 in association with Psyllidae, and this species was the most abundant clerid found on the trees. Fragments of adult and nymphal Psyllidae were found in the foregut of several field-collected adults, and larvae have been observed feeding freely on psyllid nymphs. In captivity, both larvae and adults fed on psyllids and on other insect prey provided. *Acacia* species are exploited by a wide range of wood-boring Coleoptera, but *Lemidea* larvae have not been found inside trunks or galleries and (although they are thigmotropic and secrete themselves in bark crevices) it seems likely that their usual prey consists of free-living insects. Regularity of their occurrence on young foliage growth with Psyllidae (including *Psylla acaciaebaileyanae* Froggatt and *P. acaciaedecurrentis* Froggatt) suggests that these may be a significant prey item. This is of considerable interest in providing an unusual food record for Cleridae, and also in indicating a psyllid predator potentially useful for augmenting biocontrol of such species as *Psylla uncatoides* Seeris and Klyber.

Life cycle and habits

L. subaenea is univoltine near Melbourne. Adults are found from August to November, and are most numerous in September. They are diurnal and active, and are often to be seen on younger growth and flowering shoots of acacias. They are general predators, and cannibalism is frequent when adults are confined. Fifteen pairs kept in separate 12-dram vials without other food all resulted in one partner being eaten and, in most cases, the survivor was also mutilated. When confined with fresh *Acacia* flowers and water alone, single young adults all died within 12 days ($N = 40$, $\bar{x} 6.4 \pm 1.9$ days). In contrast, a similar series of young adults provided with a superabundance of psyllids aphids (*Brevicoryne*) or small *Tribolium* larvae lived for up to 45 days ($N = 40$, $\bar{x} 20.3 \pm 4.7$ days).

Eggs are laid singly or in small groups. They are elongate (length 1.25 ± 0.08 mm, breadth 0.38 ± 0.03 mm, $N = 20$) and almost smooth except for traces of reticulate areolation on the upper surface. They are pale pink when laid and turn grey during development. Hatching occurred under uncontrolled laboratory conditions in 11-15 days and young larvae were immediately active. A maximum of 47 eggs was obtained from any one female, and follicles appeared to mature after about a week of adult life.

Larvae are of the typical clerid form (Böving and Champlain, 1920; Britton, 1974) and closely resemble those of species having more cryptic habits. The first instars are pale pinkish grey with head slightly darkened. The later two larval stages are darker grey, with cerci, the long thoracic and abdominal setae, head and thoracic plates all black. Mean head-widths and body lengths of the three instars ($N = 20$ of each) are (head width) 0.30, 0.57, 0.81 mm and (body length) 1.53, 5.94, 7.92 mm.

In the laboratory, when fed on psyllids alone, larvae grew well for periods of up to 5 months, and reached a size similar to that of larvae collected in the field from February to April each year. They ceased feeding and became comatose in late summer, and secreted themselves in the cotton stoppers of the vials in which they were kept. It is likely that the winter is passed in the prepupal or pupal stage (probably under bark), but these stages have not been found in the field: all stages were absent from field samples from late April until August, and the first adults found all had small (immature) reproductive systems.

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